

## **APPENDIX A**

### **Chevron Response to NJDEP Comment Letter on the PAOC 6 IWP**

## APPENDIX A

### Chevron Response to NJDEP Comment Letter on the PAOC 6 IWP

Chevron's responses to the New Jersey Department of Environmental Protection (NJDEP) comments regarding the December 2016 ex-situ stabilization (ESS) implementation work plan (IWP) for Potential Area of Concern (PAOC) 6, which is located at the former Chevron Facility in Perth Amboy, New Jersey (Facility), are provided below. The comments were provided to Chevron in a letter dated February 27, 2017. The NJDEP review comment is first provided in bold text, followed by Chevron's response.

#### NJDEP Soil Comments

- 1) Lead is not the only contaminant in PAOC 6. All other contamination must be addressed in accordance with the New Jersey TRSR.**

##### **Chevron Response:**

In accordance with the 2008 Corrective Measures Study (CMS) and the 2013 Hazardous and Solid Waste Amendments (HSWA) Permit Renewal, the principal contaminants of concern (PCOCs) in soil and groundwater include lead, tetraethyl lead (TEL), benzo(a)pyrene (BaP), benzene, and arsenic. The focus of corrective measures implementation (CMI) at the Facility is to remediate the PCOCs identified in soil and groundwater, such that PCOC concentrations meet the established Facility-specific CMI action levels. Specific to PAOC 6, the focus of the in-situ stabilization (ISS) and ESS CMI is to remediate lead, TEL, and BaP in soil to below the established CMI action levels. All other contaminants that may be present in PAOC 6 soil will be addressed by establishing a Facility-wide deed notice.

Chevron's 2014 PAOC Remedial Investigation Report (RIR) summarizes the results of soil sampling performed in PAOC 6 between June 1996 and August 2013. Soil samples collected to characterize soil quality in PAOC 6 were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and Target Analyte List (TAL) metals. Selected subsurface soil samples were also analyzed for total organic carbon (TOC) and extractable petroleum hydrocarbons (EPH). The PAOC RIR boring locations were biased toward valves and connection points or areas with visual evidence of impact as identified in aerial photography.

Soil sampling results showed that the polycyclic aromatic hydrocarbon (PAH) compounds BaP and dibenz(a,h)anthracene were detected in PAOC 6 soil at concentrations above the NJDEP Non-Residential Direct Contact Soil Remediation Standards (NRDCSRS); however, BaP was not detected at a concentration above the CMI action level of 10 milligrams per kilogram (mg/kg). The PAOC RIR concluded that detections of PAH compounds in soil may be associated with contaminated fill material because there is no history of petroleum release at PAOC 6. Lead was detected in one soil sample collected from boring S3879 at a concentration of 2,200 mg/kg, which is above the NJDEP NRDCSRS and the CMI action level of 800 mg/kg. The PAOC RIR also reported that the presence of lead in PAOC 6 soil may be attributed to the historical industrial site usage and the presence of historical backfill. VOCs were not

detected in PAOC 6 soil at concentrations above the NJDEP NRDCSRS, which means benzene was not detected above the NRDCSRS and the CMI action level of 13 mg/kg.

In addition to soil sampling, groundwater sampling for Skinner's List VOCs, Skinner's List SVOCs, and lead was conducted at temporary well location HP-0121 in September 1997. Hydropunch locations H1102, H1145, H1169, H1397, and H1398 were sampled for TCL VOCs in July and August 2013. Groundwater sampling results show that benzene and total xylenes were the only contaminants detected in groundwater at concentrations above the NJDEP Ground Water Quality Standards (GWQS). However, benzene was not detected in PAOC 6 groundwater above the CMI action level of 100 micrograms per liter (µg/L).

The PAOC RIR recommended that the benzene detected in PAOC 6 groundwater be addressed through monitored natural attenuation (MNA) and no further investigation is warranted for PAOC 6. In its comment letter on the PAOC RIR dated July 15, 2014, NJDEP stated that the no further investigation proposal was unacceptable and the lead exceedance identified in surface soil must be delineated and remediated. In response to NJDEP's comment, Chevron proposed additional soil investigation to evaluate lead in surface soil to the east of PAOC 6. Chevron's 2015 Supplemental PAOC RIR summarizes the results of the additional soil sampling performed in PAOC 6. This additional sampling identified lead in surface soil at concentrations ranging from 828 mg/kg to 22,300 mg/kg.

In Chevron's November 20, 2015, response to NJDEP comments letter, based on the level of lead contamination in surface soil, Chevron agreed to include PAOC 6 in the HSWA Permit Renewal and remediate PAOC 6 under the current CMI. PAOC 6 has not yet been formally added to the HSWA Permit Renewal; however, Chevron agreed to remediate lead contamination in surface soil in PAOC 6 as part of the CMI.

Since no other PCOCs were identified in PAOC 6 soil at concentrations above the CMI action levels during previous investigations conducted as part of the PAOC RIR, the soil remediation proposed for PAOC 6 was focused on addressing lead contamination in soil.

- 2) Any lead-impacted soil that extends to the east side of Tank 326 and beyond Remediation Area B shall be addressed under AOC 41.**

**Chevron Response:**

Chevron acknowledges this comment. The CMs that were implemented in the combined AOC 23, AOC 41, and Solid Waste Management Unit (SWMU) 18 area addressed any lead impacted soil identified on the east side of Tank 326.

- 3) Assuming the sample depth in Table 1 is based on " below ground surface" (bgs), lead-impacted soil was detected in excess of the NJDEP Soil Remediation Standard at a depth of 5 feet bgs in sample S5314, found in Remediation Area D. However, the description in Section 5.2.4 for remediation Area D gives the maximum depth of the excavation to be 4 feet bgs. Please clarify this issue.**

**Chevron Response:**

NJDEP is correct, sample depths provided in Table 1 are based on depth bgs. For soil sample S5314, lead-impacted soil was identified at 4.5 to 5 feet bgs as shown on Figures 6 and 8 of the PAOC 6 ESS IWP. The text in Section 5.2.4 incorrectly states "*lead-impacted soil was identified in PDI soil borings S5297 and S5314 at depths ranging from 0.0 to 4.0 feet bgs.*" The text should have stated that lead-impacted soil was identified at depths ranging from 0.0 to 5.0 feet bgs. The last paragraph of Section 5.2.4, however, states the following "*ESS will be implemented in Area D to address the lead-impacted soil within the limits depicted on Figure 9. ESS will be implemented from 0.0 to 5.5 feet bgs (i.e., from ground surface to El. -1.0 feet [NGVD 29]).*" The table included on Figure 9 of the PAOC 6 IWP shows that ESS in Area D will be implemented from 0.0 to 5.5 feet bgs. Further, Table 2 of the PAOC 6 ESS IWP identifies proposed post-implementation soil sample D-4 as an excavation floor sample to be collected from the floor of the excavation at a depth of 5.5 to 6.0 feet bgs. A revised Section 5.2.4 (page 12) of the PAOC 6 ESS IWP is included as an attachment below.

- 4) **The corrective measures proposed for PAOC 6 are limited by self-imposed buffer requirements. Specifically, the excavation can only extend up to 5 feet from the existing utilities. Chevron is proposing to implement a facility-wide deed notice to address "all contaminants remaining is soil above the most stringent NJDEP Soil Remediation Standards, including lead-impacted soils located in the inaccessible areas of PAOC 6." The Department recommends that the " inaccessible areas" in PAOC 6 be remediated (ESS) at any point prior to formal site-wide closure if the reasons for the self-imposed buffer requirements are modified (i.e., pipes are removed).**

**Chevron Response:**

Chevron acknowledges this comment.

**NJDEP Ground Water Comments**

The Department's ground water comments concern LNAPL investigation and remediation. LNAPL is not discussed in the soil ESS IWP. Please note the following:

- LNAPL impacts are identified in the boring logs provided in January 2017. Since some of the logs are only 2-3' deep bgs, and are within the ESS limits identified in the IWP, the impacted zones will be removed. In these cases, deeper LNAPL impacts may exist that have not been characterized.
- Some boring locations are at upgradient or downgradient edges of the ESS IWP areas, so delineation is not complete. LNAPL impacts may be present under AST 326.
- Some impacted locations are outside of ESS IWP areas and are not addressed.
- Ground water impacts are not characterized by sampling points north of the LNAPL impacted area (P-1), or by MW-117, the closest downgradient location, which is hundreds of feet away and downgradient of utilities.
- The LNAPL borings logs of note regarding LNAPL include:

SB-0208: Sheen; TD 10' bgs  
SB-0211: Sheen; TD 12' bgs  
S1012: Sheen; TD 15' bgs  
S1284: Sheen; TD 15' bgs  
S2443: OVM  
S4722: PID over 1474-2975; TD 2' bgs  
S4729: PID 1751-1929; TD 2' bgs  
S4730: PID 663; TD 2' bgs  
S4734: PID 1519; TD 3' bgs  
S4736: PID 652-1106; TD 3' bgs  
S4867: PID 505-9990; TD 4.5' bgs  
S4868: PID 9600 to 9999; TD 2' bgs  
S5231: NAPL, PID max 2026; TD 9' bgs  
S5291: NAPL, PID max 927; TD 3.5' bgs  
S5292: NAPL, PID 1185-3314 3.5-4.5' bgs; TD 5' bgs  
S5293: PID 1185-2109; TD 4' bgs  
S5294: NAPL, PID 960-3730; TD 4' bgs  
S5295: Sheen; TD 4' bgs  
S5296: Sheen; TD 3' bgs S5297: Sheen; TD 4' bgs  
S5298: Sheen, NAPL, PID 840-3503; TD 4' bgs  
S5313: PID 10 32-336 1; TD 5' bgs  
S5314: NAPL, PID 872-1652; TD 5' bgs

- Other Boring Log Descriptions that are of concern include:

S0774: "gelatinous substance"  
S1012: Sheen; yellow orange "organics"  
S2136: Yellowish liquid with weathered petroleum on core  
S2207: Yellow liquid, yellow staining, yellow staining liquid

Based on the above, remediation at PAOC 6 must address the following:

1. Describe how LNAPL and PID observations were addressed by the ESS IWP, and how any remaining impacts will be investigated and addressed.
2. Determine if any additional characterization sampling of the gelatinous, yellow staining/liquids, etc. is needed.
3. Further investigate ground water to evaluate ground water impacts and remedial actions. Existing monitor wells are not downgradient (P-1) or are too far away (MW-117) to assess impacts identified by the PAOC 6 ESS IWP. NAPL impacts may be present under AST 326.

#### **Chevron Response to Groundwater Comments 1, 2, and 3:**

In accordance with the 2008 CMS and the 2013 HSWA Permit Renewal, ESS was selected as the CM to remediate lead, TEL, and BaP impacts in soil at concentrations above the CMI action levels. Based on historical investigation sampling results and as presented in the CMS and HSWA Permit Renewal, the only PCOC detected in PAOC 6 soil or groundwater at concentrations above the CMI action levels was lead in soil. The PAOC 6 ESS IWP was prepared to document the

delineation of lead-impacted soil identified during the PAOC 6 RI and to outline the remedial strategy to address lead-impacted soil.

**Response Specific to Comment #1:**

While the focus of the ESS IWP was to address lead impacts in soil, all available data from PAOC 6 including information from light non-aqueous phase liquid (LNAPL) investigations were evaluated. As discussed in the response to NJDEP soil comment #1 above, lead was the only PCOC detected in PAOC 6 soil that exceeded the CMI action levels. Review of available sampling data for PAOC 6 shows that a measurable thickness of LNAPL on the groundwater table was not identified in any of the temporary well points or hydropunch locations installed and sampled within the PAOC 6 area. Further, analyses of temporary well point and hydropunch groundwater samples collected from PAOC 6 did not detect benzene in groundwater at concentrations above the CMI action level.

Since measurable LNAPL was not identified, the petroleum staining or sheen on soil cores represents residual LNAPL bound in the soil matrix, not a mobile separate phase that will migrate with groundwater. The relatively higher photoionization detector (PID) readings may be indicative of residual LNAPL bound to the soil matrix or may also reflect low-level VOC impacts in soil and/or groundwater.

Since LNAPL was not identified in the temporary well point/hydropunch locations and benzene was not identified in soil or groundwater at concentrations above CMI action levels, no further investigation is warranted to evaluate LNAPL or benzene in PAOC 6 soil or groundwater.

**Response Specific to Comment #2:**

The “gelatinous substance” noted on some of the “older” boring logs has since been identified as degraded catalyst beads that were used in the petroleum refining process. Soil borings S0774, S1012, S2136, and S2207, where the gelatinous substance and yellow staining/liquids were noted, are in SWMU 19, not in the PAOC 6 ESS CMI area. Impacts identified in these borings were remediated by the CMs implemented in SWMU 19 as proposed in the NJDEP-approved SWMU 19 ESS IWP. The gelatinous substance identified in boring S2136 was sampled and analyzed for VOCs, SVOCs, and metals. Results showed that high PAHs were detected in the sample, including BaP. The BaP impact identified in boring S2136 has been remediated through implementation of the ESS CM in SWMU 19. A construction completion report was prepared documenting completion of the SWMU 19 CMI and was submitted to the USEPA and NJDEP on December 12, 2019.

The yellow-orange “organics” noted on the boring log for boring S1012 simply describes the color of the organic material (i.e., plant material) identified in the soil core at 12 feet bgs where native peat was encountered. The use of the word “organics” does not refer to “organic chemicals,” such as VOCs.

The “yellow liquid/staining” noted on boring log for soil boring S2207 was sampled for SVOC analysis. Analytical results indicated that BaP was not detected above the CMI action level.

The sampling and analyses performed to evaluate the “gelatinous substance,” “orange organics,” and “yellow liquid/staining” identified in the SWMU 19 soil borings indicate that BaP was the only PCOC detected above CMI action levels. Based on the information presented above, no additional investigation or characterization is warranted to evaluate soil in SWMU 19 or in PAOC 6. As stated above, the BaP-impacted soil identified in boring S2136 was remediated through the SWMU 19 CMI.

**Response Specific to Comment #3:**

Groundwater in the PAOC 6 ESS area was evaluated during previous PAOC RI sampling events. Groundwater samples were collected from temporary well point and hydropunch sample locations within PAOC 6 for VOC, SVOC, and metals analysis. PCOCs (i.e., lead, benzene, and BaP) were not detected in PAOC 6 groundwater at concentrations above CMI action levels. Since PCOCs were not detected in PAOC 6 groundwater above CMI action levels, no further investigation of groundwater is warranted under the PAOC 6 CMI.

Lead in PAOC 6 soil was excavated for disposal in the Facility Corrective Action Management Unit (CAMU). Since lead was not identified in PAOC 6 groundwater prior to the implementation of the ESS CM, and the ESS CM removed the potential source of lead, post-remediation groundwater sampling to evaluate lead in groundwater is not warranted. Potential soil and groundwater impacts downgradient (east) of PAOC 6 were addressed by the CMs implemented in the AOC 23, AOC 41, and SWMU 18 CMI area. The AOC 23, AOC 41, and SWMU 18 ISS-ESS IWP (Chevron 2017) presents the CMs to remediate lead, TEL, and benzene impacts in soil and benzene impacts in groundwater. The impacted soil was excavated and disposed of in the CAMU.

NJDEP's concern that LNAPL may be present beneath Tank 326 is noted. The PAOC 6 soil excavations and the AOC 23, AOC 41, and SWMU 18 area excavations are located around the perimeter of Tank 326 and extended to within five feet of the tank. LNAPL was not encountered during the CMI in these areas, therefore further investigation was not warranted.



## LIST OF REFERENCES

Chevron. 2008. Corrective Measures Study Report for the Main Yard, East Yard and Central Yard. Prepared by URS Corporation. November.

Chevron. 2014. Potential Area of Concern Remedial Investigation Report, Former Chevron Perth Amboy Facility, Perth Amboy, New Jersey. May.

Chevron. 2015. PAOC Supplemental Remedial Investigation Report, Former Chevron Perth Amboy Facility, Perth Amboy, New Jersey. June 29.

Chevron 2015. Chevron Response to NJDEP Comments – Dated July 15, 2015. PAOC Remedial Investigation Report. November 20.

Chevron. 2016. Ex-Situ Stabilization Implementation Work Plan, PAOC 6, Former Chevron Perth Amboy Facility, Perth Amboy, New Jersey. December.

Chevron. 2017. AOC 23, AOC 41, SWMU 18 In-Situ and Ex-Situ Stabilization Implementation Work Plan.

USEPA. 2013. Chevron USA, Inc. – Buckeye Perth Amboy Terminal LLC Final HSWA Permit Renewal and Permit Modification I, Chevron-Buckeye, Perth Amboy, New Jersey, EPA ID# NJD081982902. July.